

REMARKS/ARGUMENTS

Status of Claims

Claims 1-37 are pending. As demonstrated below, all of the claims contain subject matter which is allowable.

Interview Summary

The Applicant thanks the Examiner for the interview on March 12, 2007. During the interview, the Applicant highlighted portions of the claims including *a control unit for generating control signal based on the consuming current and a battery recharging current and a recharging unit for regulating the current to the rechargeable battery in proportion to the control signal output from the control unit and the battery recharging current detected by the recharging current detect unit*. The Applicant's characterization of the interview differs from the Examiner's characterization. The Applicant did not point out that the *crux* of the invention is a control unit. Applicant merely highlighted a few portions, in a non-limiting manner, of the claimed features.

Allowable Subject Matter

The Applicant thanks the Examiner for indication that claims 23, 24, 25 and 27 are allowable if rewritten in independent form. However, the Applicant believes that all claims are allowable.

Accordingly, Applicant believe that claims 26 and 28-34 are also allowable because they depend on allowable base claims.

Rejection of claims 1-4, 6-10 and 12-13 under 35 USC 102(b) as being anticipated by Matsuda

The Examiner maintains that claims 1-4, 6-10, 12 and 13 are anticipated under 35 USC § 102(b) by Matsuda. The Applicant respectfully traverses this rejection and requests reconsideration of these rejections because Matsuda, neither explicitly nor implicitly, discloses, teaches or suggests all of the limitations of these claims. In particular, claim 1 as previously amended requires:

A digital device capable of recharging a rechargeable battery comprising:
a consuming current detect unit for detecting a consuming

current input to the digital device;
a control unit for generating a control signal based on the consuming current and a battery recharging current;
a recharging current detect unit for detecting the battery recharging current as the battery is recharged; and
a recharging control unit for regulating the current to the rechargeable battery in proportion to the control signal output from the control unit and the battery recharging current detected by the recharging current detect unit. (Emphasis added.)

As recited, claim 1 includes a control unit and a recharging control unit. The control unit is for generating a control signal based on the consuming current and a battery recharging current. The recharging control unit is for regulating the current to the rechargeable battery in proportion to the control signal output from the control unit and the battery recharging current detected by the recharging current detect unit. An example of this configuration is seen in Applicant's FIG. 2. There, a control unit 20 is supplied with input signals from the consuming current detect unit 10 *and* the recharging current detect unit 40. Also, a recharging control unit 30 has an input from the control unit 20 as well as an input from the recharging current detect unit 40. Matsuda simply does not disclose, teach or suggest this unique arrangement.

Matsuda's FIG. 4 discloses a recharging control unit 54 that regulates the current to the battery (through T_{r1}) and has input from a control unit 56 and the detected battery recharging current (from resistors R_{0-4}). However, even if it is assumed *arguendo* that Matsuda's element 54 discloses a recharging control unit as presently claimed, nowhere does Matsuda also disclose a control unit for generating a control signal based on the consuming current and a battery recharging current. At best, even if Matsuda's controller 56 is considered a control unit, Matsuda does not disclose, teach or suggest that the control unit 56 generates a control signal based on the consuming current *and* the battery recharging current. Element 56 is only disclosed as having an input from battery recharging current (through element 55). As such, Matsuda does not disclose, teach or suggest all elements as instantly claimed.

What remains missing from the disclosure of Matsuda are the several additional claim elements including the arrangement of these elements. The claim recites a control unit *and* a recharging control unit. The claim also recites that the control unit generates a control signal based on the consuming current and the battery recharging current *and* that the recharging control unit regulates the current to the battery in proportion to the control signal output from

the control unit and the detected battery recharge current. In the rejection, the Examiner asserts that element 16 discloses a control unit. The rejection further asserts that elements 4, 16 and 56 disclose a recharging control unit. First, element 56 is not shown in FIG. 1 so that the rejection has not made clear how the claim is anticipated. Second, the rejection has merely restated the functional elements of the control unit and recharging control unit without explaining how or where Matsuda actually discloses them. That is, the rejection has not made clear where or how in FIG. 1 (or anywhere in Matsuda) a recharging control unit is provided that regulates current to the battery in proportion to *the control signal output from the control unit and the detected battery recharging current*. Nor does the rejection make clear where or how a control unit is provided that generates a control signal based on the consuming current *and* the battery recharging current. This unique arrangement of elements is simply not disclosed, taught or suggested by Matsuda.

The present application provides a *control unit for generating a control signal based on the consuming current and a battery recharging current and a recharging control unit for regulating the current to the rechargeable battery in proportion to the control signal output from the control unit and the battery recharging current detected by the recharging current detect unit*. This unique combination reduces the number of required components as compared to Matsuda. That is, whereas the present invention uses a control unit (e.g. 20) to provide a control signal, Matsuda has in place several operational amplifiers (540-3, 4, 5 and 6), a PWM Comparator (542) and a triangular wave generator (541) to control the recharging current. Such additional components are eliminated by embodiments of the invention which alleviates the increasing production costs.

In all, Matsuda fails to disclose, teach or suggest, either explicitly or implicitly all the limitations of claim 1. Matsuda does not disclose, teach or suggest a control unit for generating a control signal based on the consuming current *and* a battery recharging current, as recited in Applicant's claim 1. Therefore, claim 1 is allowable over Matsuda for the reasons given above. Moreover, dependent claims 2-7 are allowable for the reasons given above by virtue of their dependence on claim 1.

Similar to claim 1, method claim 8 recites the step of generating a control signal based on a detected consuming current *and* a detected battery recharge current which control signal is used to regulate the current to the battery. Again, Matsuda does not disclose, teach or suggest such a method wherein a control signal is based on a detected consuming current and detected recharging current. Thus, Matsuda fails to disclose, teach or suggest, either

explicitly or implicitly, all the limitations of claim 8 and thus claim 8 is allowable over Matsuda for the reasons given above and with reference to the arguments of claim 1. Moreover, dependent claims 9-19 and 35 are allowable by virtue of their dependence from claim 8.

The Applicant would like to respectfully note that the Examiner has failed to address similar remarks filed by the Applicant on November 30, 2006. Unless the Examiner passes these claims for allowance, the Applicant respectfully requests a disposition on these remarks/arguments. Merely asserting the same rejection without further explanation in response to Applicant's arguments/remarks does not provide a comprehensive disposition and therefore, the Applicant maintains their position and asserts that the claim is allowable.

Rejection of Claim 5 under 35 USC § 103(a) as being unpatentable over Matsuda in view of Hasegawa

Claim 1 is allowable at least because it depends on an allowable base claim. Additionally, Hasegawa merely discloses a battery residual capacity displaying system with discharged electrical quantity computation section in which a battery residual capacity displaying system in which the stored residual capacity value can be accurately updated (see col 4, lines 41-44). However, Hasegawa does not make up for Matsuda's deficiencies because Hasegawa does not disclose, teach or suggest the features of claim 5.

Rejection of Claims 11, 36 and 37 under 35 USC 103(a) as being unpatentable over Matsuda in view of Lefevre

Claim 11 is allowable at least because it depends on an allowable base claim. Additionally, Lefevre merely discloses a handheld computer that indicates the completion of battery charging by activating a charge completion indicator indicating that battery charging is complete (see col 4, lines 66-67 and col 5, lines 1-7). However, Lefevre does not make up for Matsuda's deficiencies because Lefevre does not disclose, teach or suggest *displaying a recharging complete message if the recharging current equals a predetermined value.* Accordingly, claim 11 is allowable.

Claims 36 and 37 are allowable because the Examiner fails to show why Matsuda in view of Lefevre renders the claims obvious. In fact, the Examiner fails to provide any disposition on the claimed features of claims 36 and 37. The Examiner, in the office action, merely makes a conclusory rejection that claims 36 and 37 are unpatentable over Matsuda in view of Lefevre. In any case, the Applicant has carefully reviewed Matsuda in view of Lefevre and assert that the references, Matsuda and Lefevre, alone or in combination, do not disclose, teach or suggest the features of claims:

36. A battery recharging device for charging a digital device, the device comprising:
an adapter for supplying a power source to a battery of the digital device;
a recharging current detect unit for detecting a charging current of the battery;
an LED display unit for displaying the recharging state of the battery according to the detection result of the recharging current detect unit; and
a control unit for controlling the LED display unit so that the LED display unit switches on and off a predetermined number of times if a current lower than a predetermined reference is detected, and for controlling the LED display unit so that the LED display unit lights if a current higher than a predetermined reference is detected according to the detection result of the recharging current detect unit.

37. The device according to claim 36, further comprising a consuming current detect unit for detecting a consuming current inputted from the battery recharging device to the digital device.

The Applicant respectfully requests that if the Examiner does not pass the instant application for allowance in the next action, then the Examiner provide a detailed disposition and make the next office action Non-final so the Applicant is afforded an opportunity to address the Examiner's disposition.

Rejection of Claims 14-19 under 35 USC § 103(a) as being unpatentable over Matsuda in view of Lee

Claims 14-19 are allowable at least because they depend on allowable base claims.

Additionally, the Examiner acknowledges Matsuda's deficiencies and relies on Lee to make up for those deficiencies. However, the cited portions of Lee merely disclose a rechargeable battery charging circuit with a standard charge mode, a relatively smaller charging current that is applied to the battery over a relatively longer period of time, and in a trickle charge mode, the battery charging circuit provides a relatively even smaller constant current to the battery without interruption (col 1, lines 60-67). Lee's disclosure does not disclose, teach or suggest the features of the claims. Accordingly, Matsuda in view of Lee does not disclose, teach or suggest the claimed features.

Rejection of Claim 20 under 35 USC § 103(a) as being unpatentable over Hutchinson,

IV

The Examiner has again rejected claim 20 under 35 U.S.C. 103(a) as obvious over Hutchinson, IV. Applicant respectfully requests reconsideration of this rejection because Hutchinson does not make obvious the limitations of claim 20. In particular, claim 20 states:

A method for recharging a rechargeable battery in a digital device comprising:

determining whether a voltage of the rechargeable battery is greater than 5 volts, and if so, determining that the battery is partially discharged and performing a recharge operation according to a state of the digital device being used. (Emphasis added).

Hutchinson does not make obvious the claimed method. Nowhere does Hutchinson disclose, teach or suggest a recharge operation *according to a state of the digital device being used.* Rather, Hutchinson merely teaches a recharge method without regard to a state of a digital device. For example, the recharge method taught by Hutchinson in figure 5 only accounts for a battery voltage as shown in decision steps 204 and 210. Hutchinson's method does not account for a state of a digital device being used.

In the response to arguments, the Examiner cites to column 3, lines 12-16 of Hutchinson as disclosing the performance of a recharge operation according to a state of the digital device being used. However, the cited portion of Hutchinson merely discloses that an internal battery is fast-charged to near full capacity once its voltage exceeds a threshold and that an external battery is trickle charged then fast charged. The threshold of Hutchinson is a minimum operating voltage of a phone. However, a "minimum operating voltage" of a phone is not a state of the phone. Nowhere does Hutchinson disclose, teach or suggest that a recharge operation is based on anything but the battery voltage.

Thus, Hutchinson fails to disclose, teach or suggest, either explicitly or implicitly all the limitations of claim 20. In particular, Hutchinson does not disclose performing a recharge operation *according to a state of the digital device being used,* as recited in Applicant's claim 20. Therefore, claim 20 is allowable over Matsuda for the reasons given above. Moreover, dependent claims 21 and 22 are allowable for the reasons given above by virtue of their dependence on claim 20.

Conclusion

In view of the above, it is believed that the above-identified application is in condition for allowance, and notice to that effect is respectfully requested. Should the Examiner have any questions, the Examiner is encouraged to contact the undersigned at the telephone number indicated below.

Respectfully submitted,

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